

WHAT IS CLAIMED IS:

1. A method for communicating data over transmission paths used by Bluetooth-enabled elements, the method comprising the steps of:

5 creating a matrix having a first coordinate representing a selectable number of successive future time slots and a set of second coordinate representing segments of a frequency hopping pattern of the activated paths during such time slots; and
10 scanning the first coordinate of the matrix to detect the occurrence, if any, of identical frequency hops at an intersection of the scanned first coordinate and a pair of the second coordinates, such occurrence being indicative of a collision in the time slot associated with such intersection.

15 2. A method as defined in claim 1, further comprising the step of incrementing the scan of each first coordinate by a selected number of time slots at the end of each scan that does not detect an occurrence of such identical frequency hops.

20 3. A method as defined in claim 2, in which the selected number of time slots is one.

25 4. A method as defined in claim 2, further comprising the step of updating each second coordinate to exhibit the corresponding channel hopping pattern segment that occurs during the time slots of the incremented first coordinate.

30 5. A method as defined in claim 1, further comprising the step of creating an additional second coordinate of the matrix each time an inactive path is activated, the added second coordinate exhibiting a channel hopping pattern segment of such activated path.

 6. A method as defined in claim 1, further comprising the step of deleting one of the second coordinates of the matrix each time an activated path associated with

the channel hopping pattern segment exhibited by such second coordinate is deactivated.

5 7. A method as defined in claim 1, in which the time slots of the channel hopping patterns on the activated paths are synchronized..

10 8. A method as defined in claim 1, in which the time slots of the channel hopping patterns on a pair of the activated paths are offset, and in which the method further comprises the step of offsetting one of the second coordinates of the matrix in time by an amount determined by such offset.

15 9. A method as defined in claim 1 further comprising the step of altering the transmission of data during such last-mentioned time slot on a subset of one of the activated first paths affected by such collision.

20 10. A method as defined in claim 9, further comprising the step of incrementing the scan of each first coordinate by a selected number of time slots at the end of each scan that does not detect an occurrence of such identical frequency hops.

25 11. A method as defined in claim 10, in which the selected number of time slots is one.

30 12. A method as defined in claim 10, further comprising the step of updating each second coordinate to exhibit the corresponding channel hopping segment that occurs during the time slots of the incremented first coordinate.

13. For use in a system for effecting data communication over a plurality of separate first transmission paths each adapted to connect Bluetooth-enabled elements, each first path exhibiting an independent channel hopping pattern in discrete time slots upon being activated by establishment of a connection between

the associated elements, a circuit for predicting the occurrence of a future collision of the frequency hops of the channel hopping patterns on the activated first paths, which comprises:

means defining a matrix having a first coordinate representing a selectable number of successive future time slots and second coordinates respectively exhibiting the channel hopping patterns of the activated first paths during such time slots; and

means for scanning the first coordinate of the matrix to detect the occurrence, if any, of identical frequency hops at an intersection of the scanned first coordinate and a pair of the second coordinates, such occurrence being indicative of a collision in the time slot associated with such intersection.

14. A circuit as defined in claim 13, in which the scanning means is configured for repetitive scans of the first coordinate of the matrix, and in which the circuit further comprises means for incrementing the successive scans of the first coordinates by a selectable number of time slots at the end of each scan that does not detect such occurrence.

15. A circuit as defined in claim 14, in which the selectable number of time slots is one.

16. A circuit as defined in claim 13, further comprising means operative when the first matrix coordinate is incremented for updating each second coordinate to exhibit the corresponding channel hopping segment that occurs during the time slots of the incremented first coordinate.

17. A circuit as defined in claim 13, further comprising means for creating an additional second coordinate of the matrix each time an inactive first path is activated, the added second coordinate exhibiting the channel hopping pattern of such activated first path.

18. A circuit as defined in claim 13, further comprising means for deleting a second coordinate of the matrix each time an activated first path associated with the channel hopping pattern exhibited by such second coordinate is deactivated.

5 19. A circuit as defined in claim 13, in which the time slots of the separate channel hopping patterns on the activated first paths are synchronized.

10 20. A circuit as defined in claim 13, in which in which the time slots of the channel hopping patterns on a pair of the activated first paths are offset, and in which the circuit further comprises means for offsetting one of the second coordinates of the matrix in time by an amount determined by such offset.

21. A terminal for communicating data on a channel in accordance with the Bluetooth protocols, said terminal comprising:

15 a plurality of radio interfaces, each of said plurality of radio interfaces being coupled to a separate radio module;

a controller coupled to each of said plurality of radio interfaces, said controller having first inputs for receiving clock counts from said radio modules and second inputs for receiving the Bluetooth addresses of said radio modules;

20 a prediction circuit for generating markers indicative of frequency collisions on the channel, said prediction circuit being coupled to said controller; and

an adjustment circuit coupled to said prediction circuit, said adjustment circuit using said prediction circuit markers to direct said controller to alter transmission on the channel from said plurality of radio interfaces.

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22. The terminal of claim 21 further comprising:

means for defining a matrix having a first coordinate representing a selectable number of successive future time slots and second coordinates respectively exhibiting the channel hopping patterns of the activated first paths during such time slots; and

30 means for scanning the first coordinate of the matrix to detect the occurrence, if any, of identical frequency hops at an intersection of the scanned first coordinate and a

pair of the second coordinates, such occurrence being indicative of a collision in the time slot associated with such intersection.

23. A circuit as defined in claim 22, in which the scanning means is configured for repetitive scans of the first coordinate of the matrix, and in which the circuit further comprises means for incrementing the successive scans of the first coordinates by a selectable number of time slots at the end of each scan that does not detect such occurrence.

24. In a Bluetooth-enabled terminal:

a plurality of radio interfaces for supporting separate radio modules adapted to separately activate transmission paths;

means coupled to the radio interfaces and the radio modules for modulating the respective radio modules with separate channel hopping patterns in discrete time slots for effecting packet transmission over activated ones of the paths;

means defining a matrix having a first coordinate representing a selectable number of successive future time slots and second coordinates respectively exhibiting segments of the channel hopping patterns of the activated first paths during such time slots; and

means for scanning the first coordinate of the matrix to detect the occurrence, if any, of identical frequency hops of the channel hopping pattern segments at an intersection of the scanned first coordinate and a pair of the second coordinates, such occurrence being indicative of a frequency hop collision in the time slot associated with such intersection.